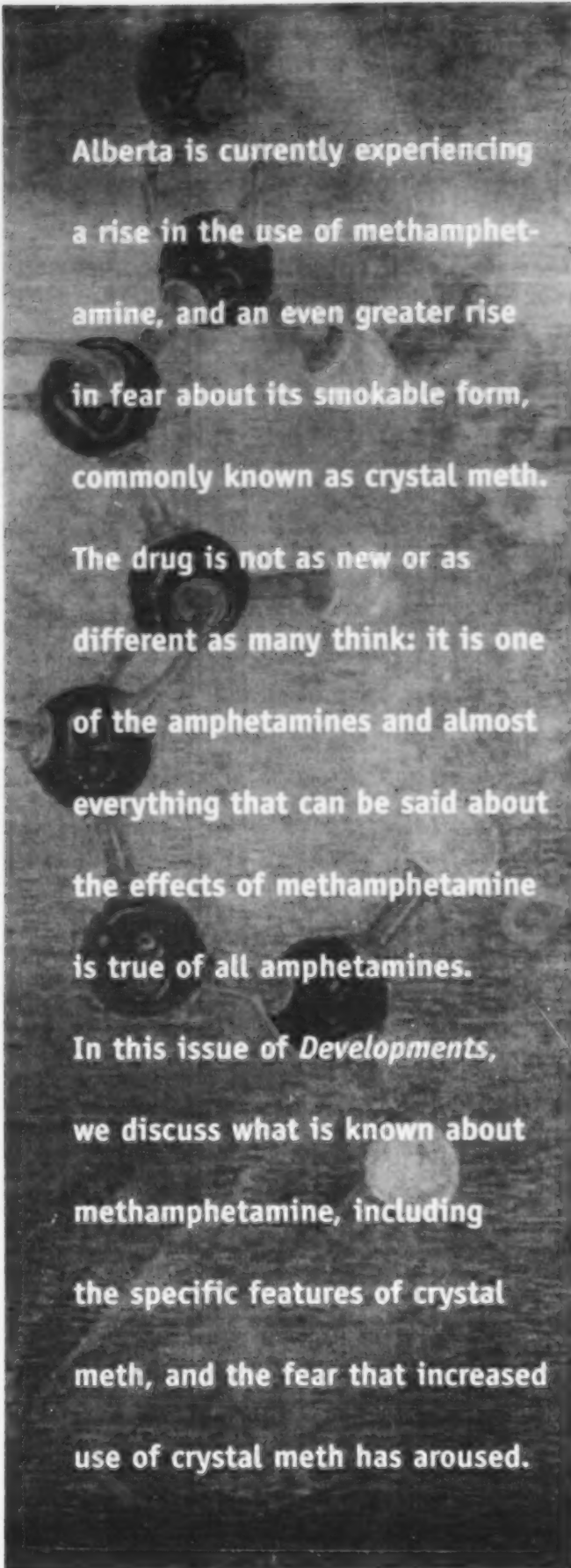


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CRYSTAL METH



Alberta is currently experiencing a rise in the use of methamphetamine, and an even greater rise in fear about its smokable form, commonly known as crystal meth. The drug is not as new or as different as many think: it is one of the amphetamines and almost everything that can be said about the effects of methamphetamine is true of all amphetamines. In this issue of *Developments*, we discuss what is known about methamphetamine, including the specific features of crystal meth, and the fear that increased use of crystal meth has aroused.

An old drug takes a new shape

By Deirdre Ah Shene, AADAC Writer-Editor

METHAMPHETAMINE IS A STIMULANT. It belongs to the group of chemicals that is called speed on the streets. Users often say "speed" to describe the desired effects of a drug, rather than its chemical structure: after all, when they buy an illegal drug, they do not necessarily know what they are getting. The crystalline form of methamphetamine also goes by the street names jib, crank, glass, and ice.

Methamphetamine is one of the amphetamines, a group of chemicals related by their molecular structure and content. Unlike crack, which must be synthesized from cocaine, which comes from natural and highly controlled substances, amphetamines can be prepared from simple chemical precursors. Currently, though, methamphetamine is most commonly prepared from ephedrine or pseudo-ephedrine and other commonly available ingredients.

The amphetamines very much resemble adrenaline in structure. Adrenaline occurs naturally in the body and produces the "flight or fight" response of the sympathetic nervous system.

Crystal meth is simply a different form of methamphetamine, a drug first synthesized in 1919. By adding a small molecule group (hydrochloric acid), manufacturers can make methamphetamine that at room temperature resembles ice crystals, hence called "ice" or "crystal" meth. This form remains volatile and retains its psychoactive properties when heated: this means that it can be smoked. Smoking gives a much faster high than the more traditional method of swallowing. It is also more convenient than injecting.

Methamphetamine is smoked by taking puffs of the vapourized compound from a pipe. Either smoking or injecting methamphetamine produces an almost instantaneous high; a high follows 3 to 5 minutes after snorting and 20 to 30 minutes after swallowing. Methamphetamine is more quickly and more completely absorbed by the brain than is amphetamine, so the high is faster and more intense. Crack users reportedly say that they cannot distinguish the high of smoked methamphetamine from the high that crack gives them, except that the methamphetamine high lasts longer.

Methamphetamine acts on the brain's reward pathway, increasing the release of the neurotransmitters dopamine, noradrenaline and serotonin, and reducing the reuptake of dopamine. Neurotransmitters are messenger chemicals, the means by which one nerve communicates with the next. One nerve will release a neurotransmitter into the gap between it and the next nerve cell. The neurotransmitter will stimulate or inhibit the second nerve. To avoid exces-

sive action on the second nerve, reuptake occurs: that is, the first nerve reabsorbs some of the neurotransmitter from the intercellular gap.

The pleasure users experience from methamphetamine's effects on the reward pathway is rich and profound. They feel confident, powerful, successful, sexy, and joyful.

This does not last. The natural balancing tendencies of the body assert themselves. The second cell becomes less sensitive to stimulation by the first. The first cell, unable to perform reuptake, runs out of dopamine. The user "crashes."

As with cocaine, injecting or smoking methamphetamine leads to the fastest high, but also means a faster crash. The user is "trained" to dependence because of the rapid reward and the rapid crash. Users try for another "rush" by readministering. With crystal meth, two distinct patterns of administration emerge: chronic periodic use, and bingeing. In the first, the user takes hits or puffs of vapourized methamphetamine from pipes throughout the day, perhaps as frequently as every half hour, stopping early enough to allow him or her to sleep at night. On a binge, users will administer the drug for several days at a time without sleeping, gradually increasing the dose. When they run out of the drug or their brains can no longer respond, users crash and rest.

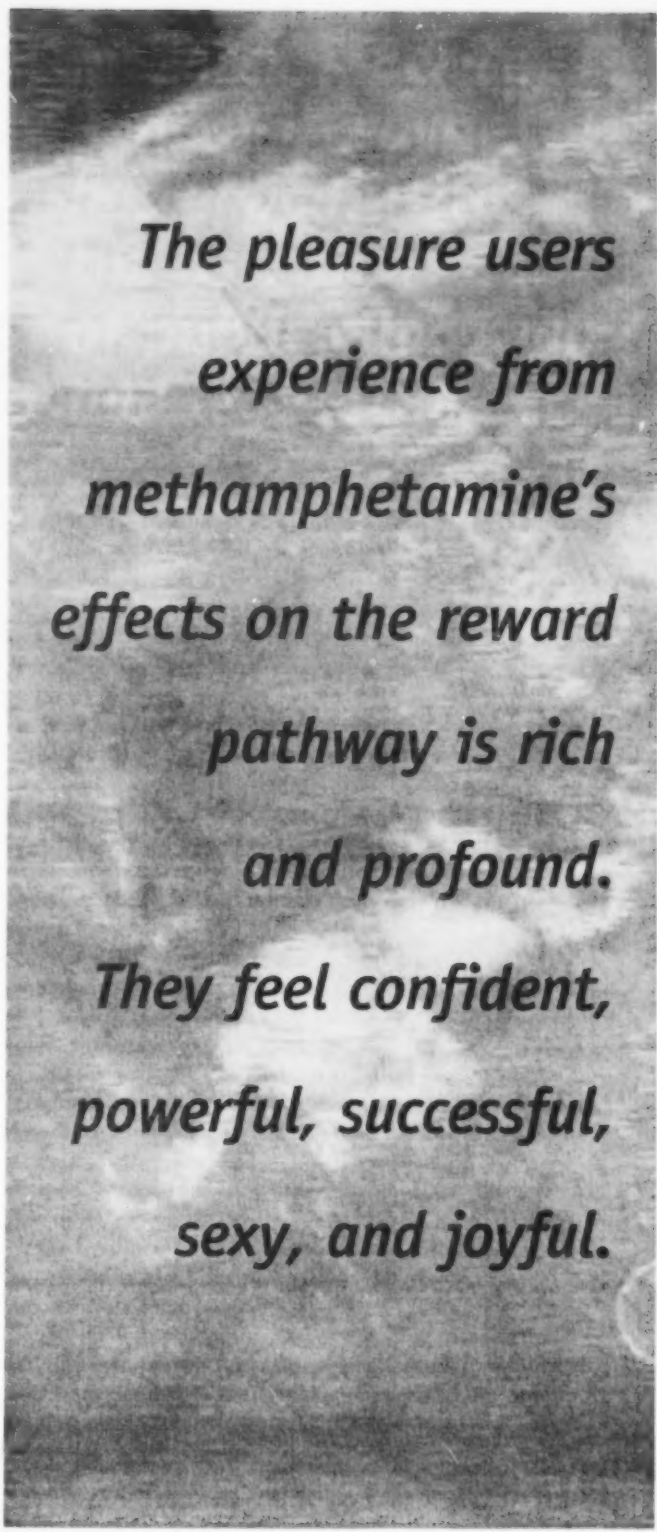
Dependence on methamphetamine is very much like dependence on cocaine. Chronic use induces a kind of brain damage: the dopaminergic neurons become exhausted and impaired. This means that a user who quits cannot even find a normal level of pleasure in ordinary activities. The temptation to use again can be overwhelming.

Like all stimulants, methamphetamine speeds up the body and mind. It stimulates the body's sympathetic nervous system so that blood pressure goes up, heart and breathing rates go up, circulation to the muscles increases as blood vessels dilate, body temperature rises, perspiration increases, bronchi (passages to the lungs) expand, pupils dilate, the mouth becomes dry and the appetite decreases. The user feels alert, restless and excited. Fatigue and sleepiness vanish. Energy increases. These effects are all congruent with the "flight or fight" response induced by adrenaline. Other observable effects include incessant talking, loss of appetite, sores, and itchy skin that can lead to scratching, further sores and infection. Visual and auditory hallucinations are common. Some people also experience nausea, vomiting, or diarrhea, blurred vision, dizziness and chest pain.

Chronic use of any of the amphetamines can cause sleep problems, and extreme depression. It can lead to a schizophrenia-like disorder, involving violent or paranoid behaviour, repetitive behaviour patterns, and visual or tactile hallucinations, especially the sensation of insects or parasites crawling on the skin.

There is anecdotal evidence that methamphetamine affects the memory of human users, but this has not been verified by research. As with all synthetic drugs, there is the danger that methamphetamine is improperly prepared: some of the intermediate compounds are known to be toxic to the brain. It is possible that those suffering extensive

brain damage have consumed adulterated methamphetamine. It is also possible that some of these users have brain damage secondary to other effects of methamphetamine. The dramatic increase in blood pressure can cause stroke and the elevated body temperature can cause direct brain damage. Seizures are also reported in susceptible users, and are the most likely cause of death from methamphetamine use.



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Fear, longing and crystal meth

By Deirdre Ah Shene, AADAC Writer-Editor

A FEW YEARS AGO, alarm spread when teenagers started using so-called "club drugs" like ecstasy, ketamine, and LSD at raves. Many of these drugs had been seen before, but the permissive social atmosphere of the rave was the new threat that galvanized the fear. A few years before that, it was "crack" cocaine. Sold cheaply in smaller amounts than powder cocaine, crack was seen as a threat to public safety, and gained notoriety with headlines about crack babies.

Today, the headlines, at least in western North America, are about crystal meth. The words are emotional. Some of the "facts" the articles present are questionable.

"New drug to hit like a Mack truck" reads the headline in one Alberta newspaper, quoting a local police detective. Beneath the headline "Wave of meth coming, police warn teachers," another Alberta daily features a quote from an undercover drug officer, trained in the United States: "This is the worst drug that has ever hit the States."

There is nothing wrong with comparing addiction to a Mack truck. Addiction is big. That's true, but it's nothing new. In an old metaphor, addiction counsellors still talk about addiction in the family as the "elephant in the living room," a phrase first coined to refer to addiction to alcohol. An addiction is usually the concern that takes up most of the emotional space in the family and preoccupies most of the family's coping efforts, whether or not anyone ever mentions it. But that is true whether the addiction is to gambling, alcohol, or any of the more exotic, more recent and therefore more scary activities or substances of abuse.

It is true that methamphetamine use is on the rise in some parts of Alberta, where it is said to be taking over from cocaine as the third most common drug of abuse (after alcohol and cannabis). A number of factors seem to be driving this change. First, it is becoming widely available because it is easily synthesized from substances that can be legally purchased. Second, it is cheaper than cocaine, which is a plant-derived substance that must be smuggled into Canada. Third, its effects are very similar to those of cocaine, but last longer. The availability of crystal meth has increased the drug's popularity because smoking it gives the quick effects of injected methamphetamine without the inconvenience and dangers of intravenous use.

The arrival of a new threat to the well-being of Albertans is always of great concern to AADAC. At the same time, we know that methamphetamine is not now nor is likely to be the biggest addiction threat to face Albertans. Alcohol has long been that, and remains so. Methamphetamine is not a new drug: this is its third wave of popularity in North America, and each wave has ebbed, with the assistance of public education and legislation.

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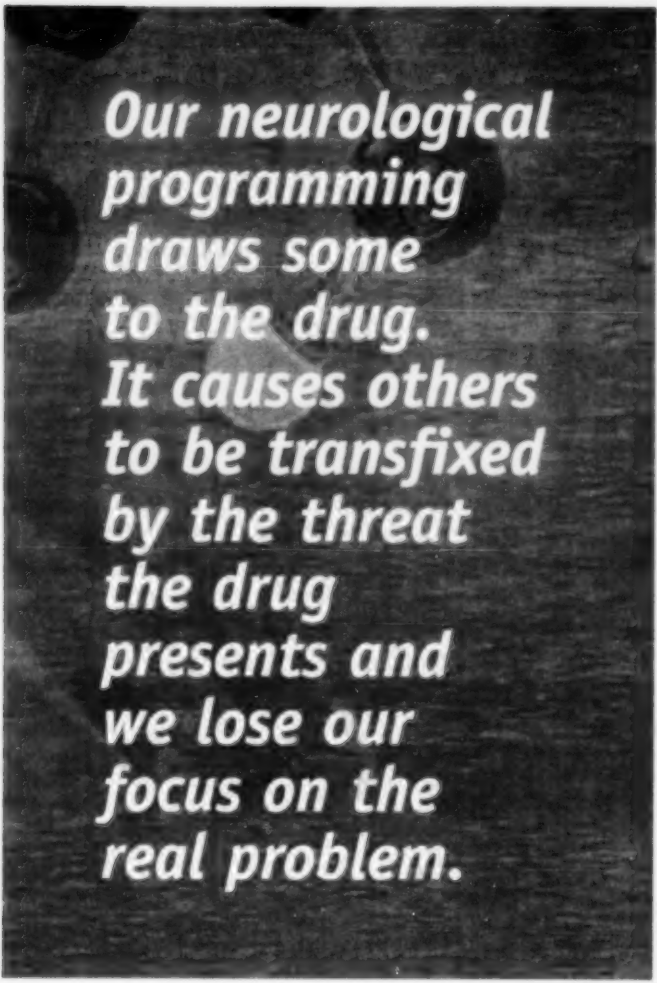
Although methamphetamine is a drug of concern, it is not "the worst drug that has ever hit the States." For that distinction, one might look to PCP (phencyclidine), called "angel dust," a drug with such dire effects that its street reputation quickly ended its use. Or one could look, again, at alcohol, the drug most associated with violent behaviour, today or in the past.

With the best of intentions, a March newspaper article reported that 42% of people who try methamphetamine once become addicted and 96% become addicted after a second try. The statistics come from a book circulated in Alberta in 2001: the author could cite the purported researcher but not the study that produced these figures. I was unable to find either that study or other corroborating research.

Figures like 42% are rare in describing addictive potential, and 96% is unheard of in reliable research, even with tobacco, one of the most addictive drugs. Such claims make newspaper articles more exciting, but they destroy credibility with the people who are most likely to be tempted to try methamphetamine: those who know others who have tried the drug. People who use the drug know when addictive potential is greatly exaggerated. They are then ready to dismiss any other warnings they hear about that drug.

We have had ample evidence that publicizing such misinformation, if misinformation it is, damages prevention efforts.

For methamphetamine, as for any drug or addictive activity, each person has a different potential for addiction, depending on his or her genetic makeup and life circumstances. Some clients report feeling that they were addicted



Our neurological programming draws some to the drug. It causes others to be transfixed by the threat the drug presents and we lose our focus on the real problem.

the first time they tried alcohol, tried smoking or gambling, tried any number of drugs. On the other hand, it is true that all the amphetamines, methamphetamine included, are highly addictive: this explains the first wave of addiction in North America, which involved people who had been prescribed the drug to treat other conditions, such as asthma, obesity or narcolepsy. It is the reason that the amphetamines are controlled substances, rarely prescribed today.

The secret of this high addictive potential appears to lie in the reward pathways of the limbic system, one of the older systems in the brain. The limbic system plays

a primary role in the neurochemical processes of pleasure, alteration of mood, and resultant addiction. Changes in the limbic system are responsible for much of the harm that results from addiction, and it is here that recovery is mediated. It is methamphetamine's effects on this part of the brain that make it a dangerous drug. If "meth" did not make people feel so good, it would never make them long for it when forced to do without.

It is interesting to note that it is also in the limbic system that response to threats is mediated. Neurologists believe that in the amygdalas, a pair of almond-shaped structures of the limbic system, lies the programming that makes humans pay more attention to new threats than to old. Thus we explain the waves of panic that accompany the rise in use of drugs that are newly formulated, rediscovered, or recently reformulated, even while other addictions continue to present dangers as great or greater.

Our neurological programming draws some people to the drug, understandably, and just as understandably causes excessive fear of the drug in others. Transfixed by the new threat, we can lose our focus on the real problem.

The real problem is addiction in general, not crystal meth in particular. For each person who becomes addicted, biology (their own biological make-up and the human biological condition) plays a part. Our individual psychological constitutions also matter, as does our environment — friends and family who use, cultural attitudes, and the legal and social structure in which we live.

AADAC holds to principles that are long supported and continue to be supported by extensive research: first, that in addiction prevention is much more powerful than cure; and second, that most addictions have a common basis. Beyond the treatment required for individual physiological impairments, addicted people respond to similar long-term treatment: promotion of self-awareness and acceptance, re-establishment of coping skills, relationship repair, and community support.

Each new drug, or each new form of an old drug, reminds us that there is an inexhaustible supply of addictive substances. Fighting each substance is swatting at flies. Preventing and treating addiction successfully requires that we acknowledge all aspects of addiction, and adopt a holistic approach and a balanced, informed response, no matter what the specific drug of concern.



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A healthy society that is free from the harmful effects of alcohol, other drugs and gambling

MISSION

Making a difference in people's lives by assisting Albertans to achieve freedom from the harmful effects of alcohol, other drugs and gambling

VALUES

We value people, treat them with respect and believe in their ability to succeed.

We value individuals, families and communities as partners in addressing addiction problems.

We value staff and their knowledge, skills, creativity, initiative, and expertise.

We value service delivery that is grounded in research and experience.

THE PURPOSE OF DEVELOPMENTS

To enhance allied professionals' knowledge and understanding of addictions issues. Developments is published six times a year and is circulated to 16,000 readers worldwide. Copyright © 2003 by AADAC. The opinions expressed by individual authors do not necessarily reflect those of the Alberta Alcohol and Drug Abuse Commission.

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AADAC RESOURCES FOR YOUTH

The Youth Awareness Series Brochures

Measuring 5 inches square (12.5 x 12.5 cm), the eleven brief and colourful brochures of the Youth Awareness Series are designed to give youth information related to addiction and help them to deal with the consequences of addiction. The series is aimed at youth facing various issues and at various stages of change. The brochures *Gambling, Smoking, Alcohol Use and Cannabis* provide balanced, useful information with a youth focus. *Power of You* gives suggestions for developing internal strength to young people suffering from the effects of their own or someone else's harmful gambling or substance use. *When Family Members Gamble, Drink or Use Drugs Too Much* and *Finding Support* help young people learn to take care of themselves in a challenging environment or begin to face their own addiction issues. Three more brochures focus on youth who have problems with gambling, alcohol, or other drugs and are considering quitting: *Safe Withdrawal from Alcohol and Other Drugs*, *AADAC Youth Services*, and *Are AADAC Services for Youth Confidential? How to Show You Are Trying* gives tips for those who have quit and are trying to rebuild relationships.

Single copies of the Youth Awareness Series brochures are available from your local AADAC office. Outside Alberta, order multiple copies at \$10 per package of 50 (plus GST, shipping and handling). Contact AADAC RD, Suite 200, 10909 Jasper Avenue, Edmonton T5J 3M9, PHONE TOLL-FREE 1-800-280-9616, FAX 780-422-5237, E-MAIL rdm@aadac.gov.ab.ca

For a description of other available AADAC resources, ask for a copy of the AADAC Resource Catalogue, free from your local AADAC office or AADAC Resource Development. You can also find our catalogue by going to www.aadac.com, clicking on the blue corporate site button, and clicking "catalogue."

AADAC RESOURCES FOR INFORMATION ON METHAMPHETAMINE

On the Web: At <http://corp.aadac.com/drugs/factsheets/index.asp>, *Quick Tips on Methamphetamine* offers information to those who are coping with someone who is withdrawing from methamphetamine, also a good quick source of general information. *The ABCs of Amphetamines* (same URL) provide more general information. In-depth information is offered by *Beyond the ABCs - Amphetamines*, at <http://corp.aadac.com/drugs/beyond/index.asp>. Information tailored to youth is found in *Just the Facts: Club Drugs, Crystal Methamphetamine* at <http://www.zoot2.com/justthefacts/clubdrugs/crystallmeth.asp>